What do you see as challenges for training the next generation of scientists? Career paths and scientific training in the United States probably need to evolve to meet current challenges. It is generally agreed that alternative (nonacademic) careers in science should be bolstered, but graduate school and postdoctoral training are getting longer as the bar for achieving a 'successful story' for publication becomes ever higher. Technology development also is acknowledged to be a driver for the biological sciences, but individuals with such interests do not have clear career paths and grant support in the academic system. We also need to consider ways of supporting young academic scientists who are willing to try creative and risky experiments, rather than a safe and guaranteed trail of papers. I am not sure that I have answers to these issues, but I think that it is time to try some 'experiments' in education and not be complacent with the status quo that has been in operation for decades.

Do you have any strong views on journals and the peer review system? We need to evolve a path away from the current journal hierarchy. Three journals are glorified for promotions and grants (and you know to which ones I am referring). But there is much more good science than can be accommodated by these journals. This hierarchy and excess demand adds to the stress on graduate students and postdoctoral fellows who feel that they need a publication in one of these 'big' journals to advance their careers. However, the problem is 'ours' as a scientific community, not the journals. We — academic institutions and granting agencies — need a better system for recognizing good science and good people and become less reliant on a 'three journal filtering system'.

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Feature

On the trail of Nepal's flora

One of the world's richest and most diverse array of plants is undergoing a new survey similar to those carried out by many nineteenth-century botanists — but with a twist. New technology should help create a twenty-first century flora to help combat the unprecedented threats from human pressures and climate change. **Nigel Williams** reports.

A hi-tech project led by a team of Edinburgh botanists gets under way this month with the aim of helping Nepal develop a detailed catalogue of its extraordinarily diverse but threatened flora. The project also involves collecting plant specimens and seeds to be held both in Nepal and the UK as a source of material protected from the increasingly hostile natural environment that may prove crucial in any future conservation and reintroduction plans.

David Knott, curator of Edinburgh's Dawyck Botanic Garden, and a member of the team, has just returned from a visit to Nepal. He said final tests had been carried out to ensure that the team were fully equipped and trained to undergo the first collections using the best practices. "It's a twenty-first century project," he says. The team will be using Global Positioning Equipment to define the location and altitude of every specimen recorded, he says. The team will also carry laptop computers, to record any botanical or other notes to accompany specimens, and digital cameras. "We shall be carrying generators to power all this equipment," he says.

Back in Nepal, Knott's colleagues Mark Watson and Colin Pendry have spent much of the last two years training 16 local botanists in Nepal. Last month they began putting the trainees through their final paces, testing them on everything from herbarium management to plant drying, before starting the project in earnest. They are expecting the mammoth undertaking to take them 15 years, but when it is finished the new floral record will be the first official account of Nepal's rich plant environment and an invaluable aid for conservationists.

Although it takes up only 0.09 per cent of the planet's land surface, Nepal comprises everything from jungles to frozen Himalayan mountains and is estimated to be home to

Vital guides: Namgal Sherpa, shows one of the blue poppies he collected from a crag in Nepal. (Photograph: David Knott, Edinburgh Botanic Gardens.)

Storm surge: A glacial flood appears to have deposited morraines to the right, threatening valley-bottom flora. (Photograph: David Knott, Edinburgh Botanic Gardens.)

6,000–7,000 species. This huge variation in altitude and environment makes it one of the most plant-rich countries in the world. By comparison the UK has 2,000 species recorded in its own flora. Knott describes the excitement at the extraordinary diversity of habitats and plants found in just one short preliminary expedition up just one mountain valley.

The project is taking place as a result of the British Government's Darwin Initiative — a scheme of grants targeted at biodiversity conservation and sustainability issues in less developed countries. The grant involves three partner institutes within Nepal: the Royal Nepal Academy of Science and Technology, the government's Department of Plant Resources, and the Department of Botany at Tribhuvan University.

The current project builds on previous grants under the Darwin Initiative that focused on Nepal's flora, a key one of which dealt with plant information and technology transfer, run by the Natural History Museum in London.

But the current project is much more ambitious. Although only funded for three years at present, the team hopes funds will be made available for the estimated 15 years it will take to complete the new project.

The Royal Botanic Gardens in Edinburgh already have a few of Nepal's most illusive plants. Collected over 100 years ago by Victorian explorers, the plants have been nurtured by generations of botanists. Back in their native homeland, some have not fared quite so well and are on the verge of extinction. The botanists hope to reintroduce Victorian and modern seedlings to Nepal from the Edinburgh gardens.

In spite of the hi-tech approach, the team will set about collecting the thousands of different plants in the same way the Victorians did — by going out and searching for them. Part of the training has involved three expeditions, with the most recent in September, going to the Sagarmatha national park in the Mount Everest region. On these expeditions, each botanist specialises in a particular plant group and gathers specimens.

But already the team are making worrying discoveries. In the picture above, a stand of gentians can be seen in the foreground but to the right, a recent deposit of morraines is visible. Knott believes these deposits are the result of a recent glacial lake outburst flood, which may have occurred because of temperature changes as a result global warming. "It looks like quite a devastating flood," he says.

With growing human pressures on native plant species too, the challenge to document Nepal's present flora is on.

Quick guide

Figs and fig wasps

James M. Cook[1] and Stuart A. West[2]

What are figs and fig wasps? Figs are plants in the genus *Ficus*, which have a unique closed inflorescence called a syconium, typically containing hundreds of flowers. We eat the ripe syconia of one species, *F. carica*, and call these 'pseudofruits' figs too. There are about 750 fig species worldwide, mostly in the tropics, where dramatic 'strangler' figs are found. These start life as epiphytes on other trees and then drop aerial roots that slowly smother and kill their host. Figs have an obligate mutualism with tiny fig-pollinating wasps (family Agaonidae). Female wasps enter receptive syconia, where they pollinate female flowers. They also lay eggs into some flowers, where their larvae induce galls. Some weeks later, the wasp offspring emerge from their galls into the syconium, just as the male flowers have matured their pollen sacs. The new generation of female wasps leave the scyonium through holes made by the males and carry pollen to receptive syconia elsewhere. This symbiosis is exploited by many species of fig-parasitic wasps. Most of them do not enter the syconium or contribute to pollination, but use long ovipositors to inject eggs through the fig wall so that their larvae can feed on either fig flowers or other wasps.

Who cares about figs and fig wasps? Monkeys, birds, bats and other animals care about figs because they eat them (Figure 1). They care a lot, because fig trees keep fruiting all year round, including times when other trees are not producing fruit. This provision of food at otherwise tricky times makes figs 'keystone' plant species, because they play a crucial role in maintaining the